



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,790	10/05/2004	Chiu-Te Lee	NAUP0474USA4	5789
27765	7590	04/18/2007		
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			EXAMINER NGUYEN, DAO H	
			ART UNIT	PAPER NUMBER
			2818	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/18/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/18/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

winstonhsu.uspto@gmail.com
Patent.admin.uspto.Rcv@naipo.com
mis.ap.uspto@naipo.com.tw

Office Action Summary

Application No.

10/711,790

Applicant(s)

LEE ET AL.

Examiner

Dao H. Nguyen

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-18,20-29,31-40 and 42-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-18,20-29,31-40 and 42-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s) *

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 0307.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Art Unit: 2818

DETAILED ACTION

1. This Office Action is in response to the communications dated 02/02/2007 through 03/04/2007, claims 1-7, 9-18, 20-29, 31-40, and 42-62 are active in this application.

Claim(s) 8, 19, 30, and 41 have been cancelled.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statement (IDS) filed on 03/04/2007. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

Remarks

3. Applicant's argument(s), filed 08/15/2006 have been fully considered, but are moot in view of new ground of rejection(s).

Claim Rejections - 35 USC § 112

Art Unit: 2818

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim(s) 1, 14, 25, 36, and 47 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 14, 25, 36, and 47, the phrase(s) "*at least one conductive plug disposed in the second dielectric layer **for connecting the first conductor, the second conductor and the metal structure***" (claims 1, 14, 25, and 47) and/or "*at least one conductive plug disposed in the second dielectric layer **for connecting the fuse and the metal structure***" (claim 36) is/are not clearly defined and distinctly pointed out the subject matter which is claimed as the Applicant's invention. It is vague that how the conductive plug being connected, or being used for connecting the various claimed elements; does it connect all of "the first conductor, the second conductor and the metal structure" together? Similarly, does it connect "the fuse and the metal structure" together? or does it connect to only one of those elements?

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

Art Unit: 2818

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim(s) 1, and 14 are rejected under 35 U. S. C. § 102 (e) as being anticipated by Carroll et al. (US Patent No. 6,356,496).

Regarding claim 1, Carroll discloses a metal layer structure, as shown in fig. 7, comprising:

a substrate 740;

a first dielectric layer 715 on a surface of the substrate 740;

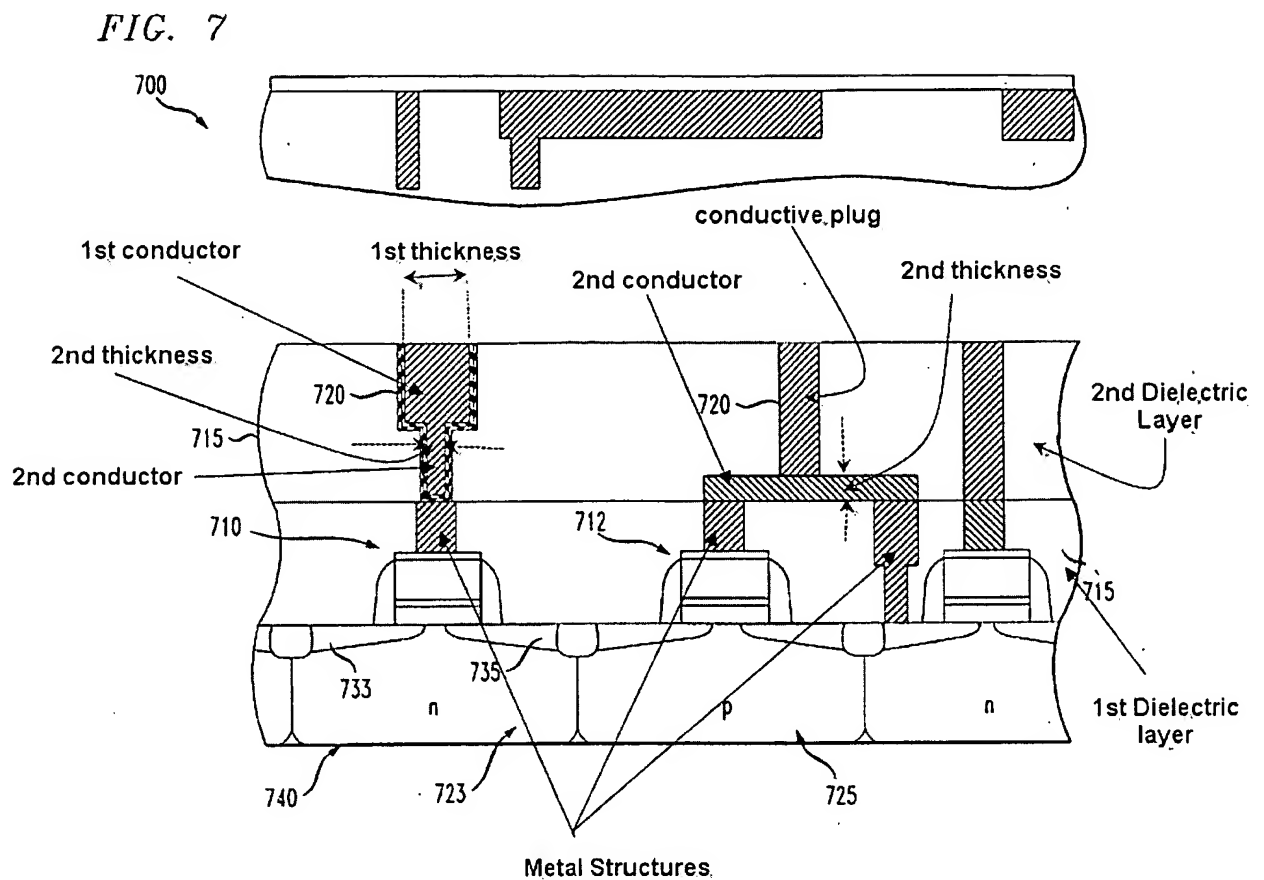
at least one metal structure (see attached figure below) disposed in the first dielectric layer 715;

a second dielectric layer 715 disposed on the first dielectric layer and the metal structure;

at least one first conductor (1st conductor) on the first dielectric layer 715;

at least one second conductor (2nd conductor) on the first dielectric layer 715, the second conductor having at least one thin portion, wherein the thickness (2nd thickness) of the thin portion is less than the thickness (1st thickness) of the first conductor; and

at least one conductive plug (see attached figure) disposed in the second dielectric layer 715 for connecting the first conductor, the second conductor and the metal structure.



Regarding claim 14, Carroll discloses a metal layer structure, as shown in fig. 7, comprising:

- a substrate 740;
- a first dielectric layer (lower layer 715) on a surface of the substrate 740;
- at least one metal structure (see attached figure below) disposed in the first dielectric layer 715;
- a second dielectric layer (upper layer 715) disposed on the first dielectric layer and the metal structure;
- at least one first conductor on the first dielectric layer 715;

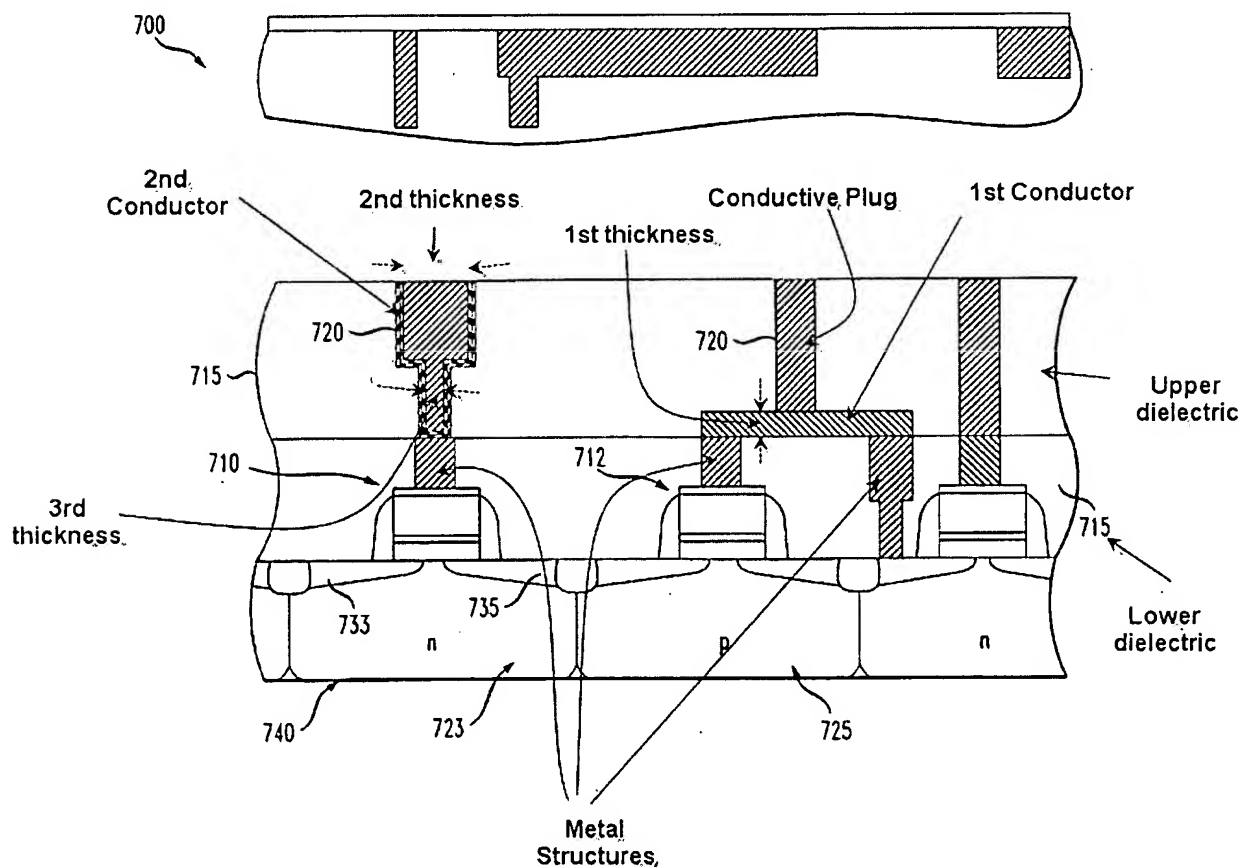
Art Unit: 2818

at least one second conductor on the first dielectric layer; and

at least one conductive plug disposed in the second dielectric layer for connecting the first conductor, the second conductor and the metal structure;

wherein the first conductor comprises a first thickness and the second conductor comprises a second thickness and a third thickness, wherein the first thickness, the second thickness, and the third thickness impart different functions to the first conductor and second conductor, respectively.

FIG. 7



Art Unit: 2818

7. Claim(s) 1, and 14 are rejected under 35 U. S. C. § 102 (b) as being anticipated by Morozumi et al. (US Patent No. 6,194,304).

Regarding claim 1, Morozumi discloses a metal layer structure, as shown in figs. 2-3, comprising:

- a substrate 11;
- a first dielectric layer I1 on a surface of the substrate 11 (fig. 3);
- at least one metal structure 33 disposed in the first dielectric layer I1;
- a second dielectric layer I2 (figs. 3A/B) disposed on the first dielectric layer I1 and the metal structure;
- at least one first conductor 35 on the first dielectric layer I1;
- at least one second conductor 34 on the first dielectric layer I1, the second conductor 34 having at least one thin portion, wherein the thickness of the thin portion is less than the thickness of the first conductor 35 (see col. 11, lines 36-44); and
- at least one conductive plug (formed within via hole 62 shown fig. 4A) disposed in the second dielectric layer I2 for connecting the first conductor 35, the second conductor 34 and the metal structure.

Regarding claim 14, Morozumi discloses a metal layer structure, as shown in figs. 2-4, comprising:

- a substrate 11;
- a first dielectric layer I1 (figs. 2) on a surface of the substrate 11;
- at least one metal structure 33 disposed in the first dielectric layer I1;

Art Unit: 2818

a second dielectric layer 12 (figs. 3) disposed on the first dielectric layer 11 and the metal structure;

at least one first conductor 34 on the first dielectric layer 11;

at least one second conductor 35 on the first dielectric layer 11; and

at least one conductive plug (formed within via hole 62 shown in fig. 4A) disposed in the second dielectric layer 12 for connecting the first conductor 34, the second conductor 35 and the metal structure 33;

wherein the first conductor 34 comprises a first thickness and the second conductor 35 comprises a second thickness and a third thickness, wherein the first thickness, the second thickness, and the third thickness impart different functions to the first conductor 34 and second conductor 35, respectively.

Claim Rejections - 35 U.S.C. § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claim(s) 1-7, 9-18, 20-29, 31-40, and 42-62 are rejected under 35 U.S.C. 103**

(a) as being unpatentable over admitted prior art (Admission), in view of U.S.

Patent No. 6,375,159 to Daubenspeck et al.

Art Unit: 2818

Regarding claim 1, Admission discloses a metal layer structure, as shown in fig. 1 of the instant application, comprising:

- a substrate 11;
- a first dielectric layer 16 (or one layer in the stack of layers 16) on a surface of the substrate 11;
- at least one metal structure 14 disposed in the first dielectric layer 16;
- a second dielectric layer 18 disposed on the first dielectric layer 16 and the metal structure 14;
- at least one first conductor 24 on the first dielectric layer 16; and
- at least one second conductor 26 (forming a fuse structure) on the first dielectric layer 16, wherein the thickness of the conductor 24 and that of the conductor 26 are proximately the same; and
- at least one conductive plug 22 disposed in the second dielectric layer 18 for connecting the first conductor 24, the second conductor 26 and the metal structure 14.

Admission does not teach that the second conductor 26 having at least one thin portion, wherein the thickness of the thin portion is less than the thickness of the first conductor.

Daubenspeck discloses a metal layer structure shown in figs. 3a/b comprising a conductor 24 on a dielectric layer 12, the conductor 24 having a recessed portion 32/26

which makes the portion of conductor 24 right under the recessed 32/26 to be thinner than other portions of the conductor 24.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted invention (Admission) so that the Admission's second conductor 26 would have a (filled) recess, as that taught by Daubenspeck, in order to increase the efficiency for the deletion of the integrated circuit metal fuses (see col. 7, lines 5-16 of Daubenspeck). By making such modification, the admitted invention would have a second conductor having at least one thin portion, wherein the thickness of the thin portion is less than the thickness of the first conductor.

Regarding claim 14, Admission discloses a metal layer structure, as shown in fig. 1 of the instant application, comprising:

- a substrate 11;
- a first dielectric layer 16 (or one layer in the stack of layers 16) on a surface of the substrate 11;
- at least one metal structure 14 disposed in the first dielectric layer 16;
- a second dielectric layer 18 disposed on the first dielectric layer 16 and the metal structure 14;
- at least one first conductor 24 on the first dielectric layer; and
- at least one second conductor 22&26 on the first dielectric layer; and

Art Unit: 2818

at least on conductive plug 22 disposed in the second dielectric layer 18 for connecting the first conductor 24, the second conductor 26 and the metal structure 14; wherein the first conductor 24 and the second conductor 26 have a first thickness and a second thickness, respectively, and the first thickness and the second thickness impart different functions to the first conductor 24 and second conductor 26, respectively (this is inherent because the first conductor is a bonding pad, while the second conductor is a fuse).

Admission does not disclose the first conductor comprises a first thickness and the second conductor comprises a second thickness and a third thickness, wherein the first thickness, the second thickness, and the third thickness impart different functions to the first conductor and second conductor, respectively.

Daubenspeck discloses a metal layer structure shown in figs. 3a/b comprising a conductor 24 on a dielectric layer 12, the conductor 24 having a recessed portion 32/26 which makes the portion of conductor 24 right under the recessed 32/26 to be thinner than other portions of the conductor 24.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted invention (Admission) so that the Admission's second conductor 26 would have a (filled) recess, as that taught by Daubenspeck, in order to increase the efficiency for the deletion of the integrated circuit

Art Unit: 2818

metal fuses (see col. 7, lines 5-16 of Daubenspeck). By making such modification, the admitted invention would have a first conductor comprises a first thickness and the second conductor comprises a second thickness and a third thickness, wherein the first thickness, the second thickness, and the third thickness impart different functions to the first conductor and second conductor, respectively.

Regarding claim 2, Admission/Daubenspeck discloses the metal layer structure wherein the second conductor has at least one thick portion. See figs. 3 of Daubenspeck.

Regarding claim 3, Admission/Daubenspeck discloses the metal layer structure wherein a thickness of the first conductor is equal to a thickness of the thick portion. See admitted fig. 1, and the figs. 3 of Daubenspeck.

Regarding claims 4 and 15, Admission/Daubenspeck discloses the metal layer structure wherein a ratio of a thickness of the thick portion to a thickness of the thin portion is approximately 1 to 8. See admitted fig. 1, and the figs. 3 of Daubenspeck.

Regarding claims 5 and 16, Admission/Daubenspeck discloses the metal layer structure wherein a thickness of the thick portion is approximately 0.8 to 1.6 μm , and a thickness of the thin portion is smaller than 0.8 μm . See the instant specification, pages 1-4; see also col. 6, lines 59-65 and figs. 3 of Daubenspeck.

Regarding claims 6, 17, Admission/Daubenspeck discloses the metal layer structure further comprising:

- a first opening 34 exposing the first conductor 24; and
- a second opening 32 exposing the thin portion; and
- a third dielectric layer on the first dielectric layer 16 that covers the first conductor 24 and the second conductor 26. See admitted figs. 1, and Daubenspeck's figs. 3.

Regarding claims 7, 18, Admission/Fischer discloses the metal layer structure comprising all claimed limitations. See the teaching of Admission in the pending specification.

Regarding claims 9 and 20, Admission/Daubenspeck discloses the metal layer structure wherein the metal structure is copper (Cu). See the instant specification, pages 1-4.

Regarding claims 10-13, 21-24, 58, and 59, Admission/Daubenspeck discloses the metal layer structure comprising all claimed limitations. See the instant specification, pages 1-4, and figs. 3 of Daubenspeck.

Regarding claim 25, Admission discloses a fuse structure, as shown in fig. 1 of the instant application, comprising:

- a substrate 11, a bonding pad area and a fuse area 26 being included on a surface of the substrate 11;

- a first dielectric layer 16 on the surface of the substrate 11;

- at least one metal structure 14 disposed in the first dielectric layer 16;

- a second dielectric layer 18 disposed on the first dielectric layer 16 and the metal structure 14;

- at least one first conductor 24 (and conductor portion at ends of fuse 26 to which plug 22 is connected to) on the first dielectric layer 11 in the bonding pad area; and

- at least one second conductor 26 on the first dielectric layer 16 in the fuse area;

and

- at least on conductive plug 22 disposed in the second dielectric layer 18 for connecting the first conductor 24, the second conductor 26 and the metal structure 14;

- wherein the first conductor 24 (and the thickness of the fuse 46 is smaller than that of the bonding pads 42a/b) having a first thickness is used as a bonding pad, and the second conductor 26 having a second thickness is used as a fuse. See fig. 4.

Admission does not teach that the second thickness is smaller than the first thickness.

Daubenspeck discloses a metal layer structure shown in figs. 3a/b comprising a conductor 24 on a dielectric layer 12, the conductor 24 having a recessed portion 32/26

Art Unit: 2818

which makes the portion of conductor 24 right under the recessed 32/26 to be thinner than other portions of the conductor 24.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted invention (Admission) so that the Admission's second conductor 26 would have a (filled) recess, as that taught by Daubenspeck, in order to increase the efficiency for the deletion of the integrated circuit metal fuses (see col. 7, lines 5-16 of Daubenspeck). By making such modification, the admitted invention would have a second conductor having a second thickness (at the recessed portion) smaller than the first thickness (at the non-recessed portion).

Regarding claim 36, Admission discloses a fuse structure, as shown in fig. 1 of the instant application, comprising:

- a substrate 11, a fuse area 26 being included on a surface of the substrate 11;
- a first dielectric layer 16 on the surface of the substrate 11;
- at least one metal structure 14 disposed in the first dielectric layer 16;
- a second dielectric layer 18 disposed on the first dielectric layer 16 and the metal structure 14;
- at least one fuse 26 on the second dielectric layer 18 in the fuse area,
- at least on conductive plug 22 disposed in the second dielectric layer 18 for connecting the first conductor 24, the second conductor 26 and the metal structure 14;

Art Unit: 2818

a third dielectric layer 32 on the second dielectric layer 18 that covers the fuse 26.

Admission does not teach that the fuse having a thin portion and a thick portion, nor that a first opening in the third dielectric layer 32 exposing the thin portion.

Daubenspeck discloses a metal layer structure shown in figs. 3a/b comprising a conductor 24 on a dielectric layer 12, the conductor 24 having a recessed portion 32/26 which makes the portion of conductor 24 right under the recessed 32/26 to be thinner than other portions of the conductor 24; wherein opening 32/26 exposing the thin portion.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted invention (Admission) so that the Admission's second conductor 26 would have a (filled) recess, as that taught by Daubenspeck, in order to increase the efficiency for the deletion of the integrated circuit metal fuses (see col. 7, lines 5-16 of Daubenspeck). By making such modification, the admitted invention would have a second conductor having at least one thin portion, wherein the thickness of the thin portion is less than the thickness of the first conductor.

Regarding claim 47, Admission discloses a metal layer structure, as shown in fig. 1 of the instant application, comprising:

a substrate 11;
a first dielectric layer 16 on a surface of the substrate 11;
at least one metal structure 14 disposed in the first dielectric layer 16;
a second dielectric layer 18 disposed on the first dielectric layer 16 and the metal structure 14;
at least one first conductor 24 on the first dielectric layer 16;
at least one second conductor 26 on the first dielectric layer 16;
at least one conductive plug 22 disposed in the second dielectric layer 18 for connecting the first conductor 24, the second conductor 26 and the metal structure 14;
wherein the first conductor 24 having a first thickness is a first material, and the second conductor 26 having a second thickness is a second material.

Admission does not teach that the second conductor having the second thickness different from the first thickness of the first conductor.

Daubenspeck discloses a metal layer structure shown in figs. 3a/b comprising a conductor 24 on a dielectric layer 12, the conductor 24 having a recessed portion 32/26 which makes the portion of conductor 24 right under the recessed 32/26 to be thinner than other portions of the conductor 24.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted invention (Admission) so that the

Admission's second conductor 26 would have a (filled) recess, as that taught by Daubenspeck, in order to increase the efficiency for the deletion of the integrated circuit metal fuses (see col. 7, lines 5-16 of Daubenspeck). By making such modification, the admitted invention would have a second conductor having a second thickness at the recessed portion different from the first thickness.

Regarding claims 26, 37, and 48, Admission/Daubenspeck discloses the metal layer structure wherein a ratio of a thickness of the thick portion to a thickness of the thin portion is approximately 1 to 8. See figs. 4,5 of Fischer.

Regarding claims 27, 38, and 49, Admission/Daubenspeck discloses the metal layer structure wherein a thickness of the thick portion is approximately 0.8 to 1.6 μm , and a thickness of the thin portion is smaller than 0.8 μm . See figs. 4, 5 of Fischer.

Regarding claims 28, 39, and 50, Admission/Daubenspeck discloses the metal layer structure further comprising:

- a first opening 34 exposing the first conductor 24; and
 - a second opening 32/26 (Daubenspeck's figs. 3) disposed the second conductor;
- and
- a third dielectric layer 32 on the first dielectric layer 16 that covers the first conductor 24 and the second conductor 26. See admitted figs. 1.

Art Unit: 2818

Regarding claims 29, 40, and 51, Admission/Daubenspeck discloses the metal layer structure comprising all claimed limitations. See the teaching of Admission in the pending specification.

Regarding claims 31, 42, and 53, Admission/Daubenspeck discloses the metal layer structure wherein the metal structure is copper (Cu). See the instant specification, pages 1-4.

Regarding claims 32, 43, and 54, Admission/Daubenspeck discloses the metal layer structure wherein the third dielectric layer is a low-k dielectric layer. See the instant specification, pages 1-4.

Regarding claims 33, 44, and 55, Admission/Daubenspeck discloses the metal layer structure wherein the metal structure is copper, and the third dielectric layer is a low-k dielectric layer. See the instant specification, pages 1-4.

Regarding claims 34, 45, and 56, Admission/Daubenspeck discloses the metal layer structure wherein a dielectric constant of the low-k dielectric layer is approximately 2.0 to 3.5. See the instant specification, pages 1-4.

Art Unit: 2818

Regarding claims 35, 46, and 57, Admission/Daubenspeck discloses the metal layer structure wherein the low-k dielectric layer comprises a carbon-contained oxide layer or an inorganic dielectric material layer. See the instant specification, pages 1-4.

Regarding claims 60-62, Admission/Daubenspeck discloses the metal layer structure comprising all claimed limitations. See the instant specification, pages 1-4.

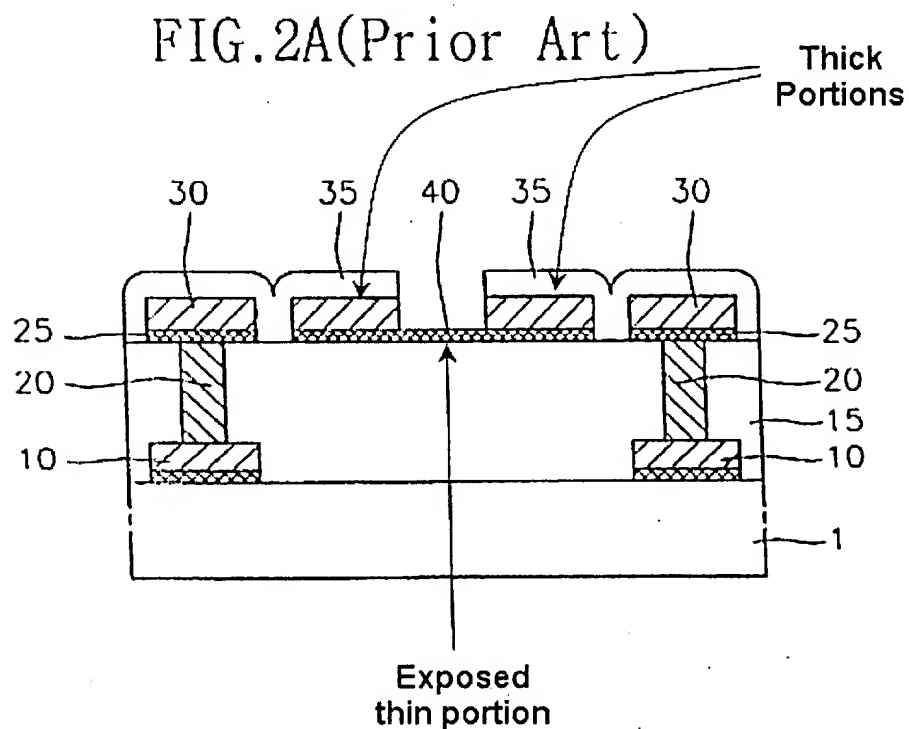
10. Claim(s) 36 is rejected under 35 U.S.C. 103 (a) as being unpatentable over admitted prior art (Admission), in view of U.S. Patent No. 6,175,145 to Lee et al.

Regarding claim 36, Admission discloses a fuse structure, as shown in fig. 1 of the instant application, comprising:

- a substrate 11, a fuse area 26 being included on a surface of the substrate 11;
- a first dielectric layer 16 on the surface of the substrate 11;
- at least one metal structure 14 disposed in the first dielectric layer 16;
- a second dielectric layer 18 disposed on the first dielectric layer 16 and the metal structure 14;
- at least one fuse 26 on the second dielectric layer 18 in the fuse area,
- at least one conductive plug 22 disposed in the second dielectric layer 18 for connecting the first conductor 24, the second conductor 26 and the metal structure 14;
- a third dielectric layer 32 on the second dielectric layer 18 that covers the fuse 26.

Admission does not teach that the fuse having a thin portion and a thick portion, nor that a first opening in the third dielectric layer 32 exposing the thin portion.

Lee discloses a metal layer structure shown in figs. 2, 5, comprising a conductor on a dielectric layer 15, the conductor having a thick portion and a thin portion (see attached figure below), and a dielectric layer 35 on the dielectric layer 15 that cover the thick portion; and an opening in the dielectric layer 35 exposing the thin portion.



It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the admitted invention (Admission) so that the

Art Unit: 2818

Admission's second conductor 26 would have a thick portion and an exposed thin portion, as that taught by Lee, in order to increase the efficiency of the fuse structure.

Conclusion

11. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571)272-1907. The fax numbers for all communication(s) is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', with a horizontal line drawn underneath it.

Dao H. Nguyen
Art Unit 2818
April 4, 2007